Remarks:

The Applicant would like to thank the Examiner for careful review of remarks filed in response to a previous Office Action. The Applicant particularly appreciates that previous rejection of certain claims in the application under 35 U.S.C. § 112 has been withdrawn. The present remarks are intended to be responsive to the new ground of rejection set forth in the Office Action of January 24, 2008. Please reconsider the application in view of the above amendments and the following remarks.

Claim Rejections – 35 U.S.C. § 103(a)

Claims 18-28 and 31-35 stand rejected as being unpatentable over Kan (U.S. Patent No. 5,343,440) in view of Eaton (6,382,332). To the extent the rejection may apply to the claims as amended, the Applicant respectfully traverses for the following reasons.

Kan as stated in previous replies, shows determining a travel time of a seismic wave from a surfaced location to a selected depth in the wellbore with a receiver inserted into the wellbore after the drill string is removed from the wellbore. Kan does not show making the travel time determination when the drill bit is at a selected depth in the wellbore.

Eaton generally discloses a bit-mounted acoustic or seismic receiver in the form of a piezoelectric element. Eaton shows a drilling rig supporting a drill string within a borehole. An acoustic receiver is associated with a drill bit connected to the end of the drill string. A seismic energy source is located at the earth's surface some distance from the rig. In operation, the acoustic source is controlled to transmit an acoustic pulse downwards into the rock formations surrounding the borehole. The acoustic energy travelling on a path reaches the rock in contact with the drill bit which is thereby detected by the acoustic receiver. Boundaries in the rock formations are detected and their positions determined by receiving signals from the source after reflection by the boundaries. Time-depth check-shots may be obtained by timing acoustic propagation along the various paths. A vertical seismic profile can be obtained by performing measurements with the drill bit at different depths in the borehole.

As amended, claim 18 recites subject matter that is not disclosed in or fairly suggested by Kan or Eaton. Specifically, the travel time of seismic energy is performed by operating the seismic receiver in the borehole at selected times corresponding to predetermined actuation times of the seismic energy source at the surface. Seismic energy from the seismic source is detected by the receiver. A processor disposed in the borehole and in signal communication with the seismic receiver is operated to detect arrivals of upgoing and downgoing seismic energy from the seismic source. See the Applicant's specification in paragraphs 0027 to 0031. Eaton, in particular, show no devices for recording and processing signals from the receiver. The disclosure in Eaton states in particular that

> [t]he acoustic energy travelling on a path 19 is reflected by a boundary 20 between two different types of rock. The boundary is below the level of the drill bit, that is to say the boundary is ahead of the drill bit 13. A proportion of the acoustic energy will be reflected by the boundary 20 on a path 21 to the drill bit 13. This will cause the drill bit 13 to vibrate, which again will be detected by the acoustic receiver 14. Acoustic energy travelling on a path 22 from the airgun 16 which is not reflected by the boundary 20 is incident on a second boundary 23. A proportion of this acoustic energy will be reflected on path 24 through the boundary 20 to the drill bit 13. This again will cause the drill bit 13 to vibrate, which will again be detected by the acoustic receiver 14. Data generated from the detected signals is transmitted to processing means (not shown) at the drilling rig 10 by well bore communication apparatus (not shown) or is processed by processing means (not shown) near the drill bit 13 and processed data is transmitted to the drilling rig 10.

[emphasis added]. There is nothing in Eaton concerning processing of signals in the borehole to determine travel times. Eaton relies on direct communication of the detected seismic signals to the surface. As is known in the art such communication can be slow, particularly if telemetry such as mud pressure modulation is used. A possible advantage of the invention set forth in claim 18 as amended is that no direct communication of seismic signals to the Earth's surface is needed. There is nothing in either of Eaton or Kan to suggest the invention of claim 18.

With respect to claims 26 and 31, the same arguments made above support Applicants' position that neither Kan nor Eaton, alone or in combination, teach or suggest the claimed invention.

The dependent claims not specifically addressed are presented as allowable for the reason that such claims ultimately depend from allowable base claims

This Reply is believed to be fully responsive to each and every ground of rejection set forth in the Office Action dated January 24, 2008, and early favorable action on this application is requested. Please apply any charges not covered, or any credits, to Deposit Account 19-0610 (Reference Number 19.0380).

Respectfully submitted,

Date: April 8, 2008

/Darla Fonseca/

Darla Fonseca, Reg. No. 31,783
Attorney for Applicant

Schlumberger Oilfield Services
200 Gillingham Lane
MD 200-9
Sugar Land, Texas 77478

Telephone: (281) 285-4490
Facsimile: (281) 285-8828